which its ardent inventor hoped would work well at 120 words, now works equally well at 600 words a minute.

The telephone, owing to mismanagement and the operation of our Patent Laws, has not received much development in England yet; but with the expiry of the patents at the end of this year it is hoped that every post-office will become an exchange, and the business of telephony will flourish as well in England as it has in Sweden and Norway and some of the smaller States in Europe. Competition and free trade will certainly tend to bring this marvellous and beautiful apparatus within the sphere of every domestic circle.

It is marvellous how science is rapidly becoming a household god. The electric light, bells, and telephones must prompt all to some knowledge of electricity. Ventilation, sanitation, pure water, warming apparatus, lead to a knowledge of other scientific principles. The laws of Nature are rapidly but surely becoming as familiar in our mouths as household words.

PENDULUM ELECTROMETER.

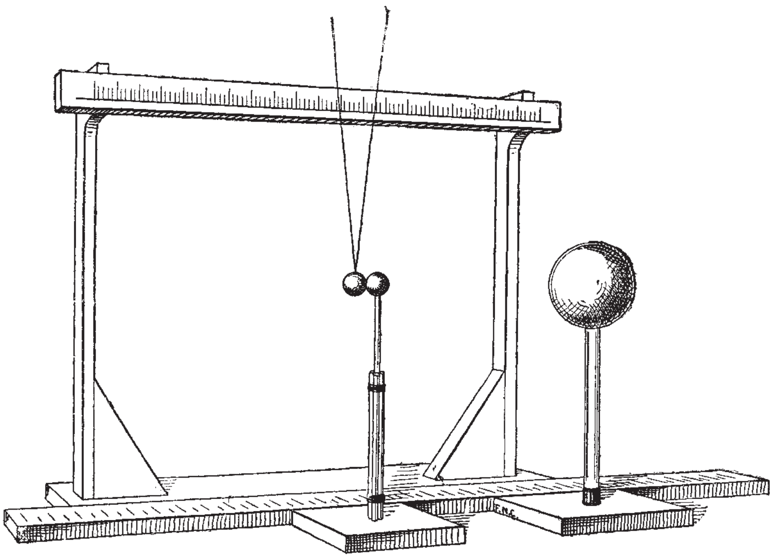
In order to obtain an inexpensive apparatus by which the nature of electrostatic measurements could be clearly presented to students, and the measurements carried out before a class with ease and despatch in absolute units, Prof. Mayer, of the Stevens Institute of Technology, of New Jersey, has arranged the apparatus shown in the accompanying figure.

It consists of a gilt pith ball of 1 cm. radius, made of pieces of pith cemented together, and suspended at a distance of 364 cm. from the ceiling by a very fine silk fibre passed through a small staple driven into the ball. The ends of the fibres are attached to the ceiling at a distance of 52 cm. apart, and arranged so that the suspended ball can be raised or lowered, until it is at the same height as a brass ball, also of 1 cm. radius, supported on a glass rod, coated while hot with paraffin wax. A force of 1 dyne acting on the suspended ball deflects it through 13·3 mm., and, as 2° deflection was the maximum employed, the scale was inclined to the horizontal so as to coincide with the chord of an angle of 2°.

If a charge be given to the two small balls when in contact, and when therefore it will divide equally between them, the charge on either in *absolute electrostatic units* equals

$$D\sqrt{\frac{d}{1\cdot33}},$$

where d is the deflection in centimetres of the pendulum from the vertical, and D the distance in centimetres between the centres of the two balls.



To test the sensitiveness of the apparatus, the ball on the stand was placed at various distances from the suspended one, and the force between them observed. The law of the inverse squares was found to be verified with an error of less than 1 per cent. when D was over $5\frac{1}{4}$ cm. Next the gradual diminution of the deflection when the brass ball on the stand was in a fixed position was used to measure the rate of loss of charge, and it was found that the measured leakage to earth was proportional to the measured charges with a considerable degree of accuracy in several experiments, and with a maximum error of 20 per cent. in the most discordant experiments. Then the pendulum electrometer was used to measure the electric distribution over the surface of a cylinder, a proof plane being employed to convey the charge from different parts of the surface of the cylinder to the pendulum electrometer, and results were obtained closely agreeing with those obtained by Coulomb. Lastly, the potential of the large sphere was experimentally determined in absolute electrostatic units for different charges given to it.

NOTES.

We are glad to learn that the President of the French Republic has conferred on Prof. Sylvester and Prof. Cayley the "Decoration d'Officier de la Légion d'Honneur." This honour has been granted in consequence of a request addressed to the French Minister of Foreign Affairs by the President and other members of the Academy of Sciences.

Lord Rayleigh has been elected a corresponding member of the Imperial Academy of Sciences in Vienna.

The French Association for the Advancement of Science will hold its nineteenth meeting at Limoges from August 7 to 14. Various English men of science have been invited by the Bureau of the Association to attend the meeting, and they are asked to let their decision be known before July 1. Those of them who accept the invitation will be the guests of the Municipality of Limoges.

The Queen has been pleased to approve of the grant of Civil List pensions to Miss Charlotte, Ruth, Margaret, and Rose, daughters of the late Rev. M. J. Berkeley, F.R.S. A Civil List pension has also been granted to Mrs. Wood, widow of the Rev. J. G. Wood, the well-known popular writer on natural history.

Dr. James Clark, M.A. (Edin.), Ph.D. (Tübingen), Royal Exhibitioner and Associate in Botany, Prizeman in Geology (Edinburgh University), has been appointed Professor of Natural History in the College of Agriculture, Downton, Salisbury. Dr. Clark has recently been employed on important work in the Natural History Department of the British Museum, and is the author of several papers on geology and biology.

A Chair of Mechanical Engineering is about to be established in connection with the University College of South Wales and Monmouthshire, Cardiff; and the authorities of the institution are already looking about for a suitable professor. A lectureship in mining engineering will shortly be founded at the same College, and electrical engineering is also to receive attention.

The Annual Congress of the British Archæological Association will be held at Oxford in the second week of July.

An important International Photographic Exhibition will be held in Vienna in April next year. The *Photographic News* says it is intended that only comparatively recent work, and that of the best kind, shall be shown. A jury of artists and photographers will decide as to the admission of pictures. The Exhibition will be held in the Imperial Austrian Museum of Art and Industry.

Mr. Thomas Layton, F.S.A., of Kew, who has for many years been engaged in forming a museum of the prehistoric antiquities of his district, has lent to the British Museum a fine series of bronze swords, spears, and axes, all found in the River Thames between Richmond and Battersea. The loan is shown in a case by itself.

A Scientific and Industrial Exhibition was to be opened at Kazan on May 27. It will contain exhibits from Eastern Russia, Siberia, Central Asia, and the Caucasus, and promises to be of great interest to ethnographers.

Dr. Adolf Strubell, of Frankfort, who started on a journey of zoological research in India in March 1889, is now in Java making scientific collections, which he intends to present to the Senckenberg Museum of Frankfort.

The celebration of the six hundredth anniversary of the foundation of the University of Montpellier has been most successful. All the great technical schools of Paris and the French provinces were represented, and deputations from many foreign Universities were present. The proceedings began on May 22, when there was a great reception in the University hall. M. Chancel, the Rector, welcomed the guests, and Prof. Tedenat sketched the history of the University and its most celebrated professors. On the following day M. Carnot arrived. The delegates of foreign Universities, followed by those of the great French schools, marched from the University to the Prefecture to be presented to the President of the Republic; and, if we may judge from a description by a correspondent of the *Times*, the procession must have been a remarkably interesting spectacle, the French and foreign professors being in robes of the most varied colours. The pavement and balconies along the route were crowded by men, women, and children. After the ceremony at the Prefecture the company proceeded to a park overlooking the town, commanding a view of the Cevennes on one side and the Mediterranean on the other. Several speeches were delivered under an awning. The Rector of the University thanked the President for having honoured the celebration by his presence. M. Croset gave a history of the University, and dwelt on the great trade of Montpellier in the Middle Ages, and its relations with the Arabs and Jews. Its most flourishing period, he said, was from the twelfth to the fourteenth century, and Petrarch spoke of it as a kind of ideal University. It made special progress in studies based on the observation of nature. The delegate of Bologna, the most ancient University represented, thanked M. Carnot for his reception of the foreign delegates. M. Bourgeois, Minister of Education, in a much-applauded speech, said the Government recognized the justice of the desire expressed by Montpellier and the other great schools to resume the name of University and the privileges associated therewith, and the question would shortly be discussed in the Chamber. We may specially note that the later proceedings included the presentation of an address by French men of science to Prof. Helmholtz, who represented the University of Berlin.

The Königliche Physikalisch-Oekonomische Gesellschaft of Königsberg, one of the oldest societies of its kind, recently celebrated its centenary. It met first in Mohrungen, but in 1792 was amalgamated with the Economical Reading Institute of Königsberg, and thereafter bore its present name. In its earlier years it dealt chiefly with rural economy and agriculture. Later on, questions of natural science came more to the front, partly under the influence of Karl Ernst von Baer, the most illustrious name in the Society's annals. Still later, the Society had an anatomist of note among its members, Heinrich Rathke, who did good work in the same field as von Baer.

Dr. T. A. Hirst, a former President of the Association for the Improvement of Geometrical Teaching, has presented to the Association, for its library, a valuable gift of forty volumes on geometry. The Association has also acquired by purchase an interesting collection of about twenty-five older text-books, including the "Treatise on Algebra" by Saunderson, the blind Lucasian Professor, and Stirling's "Methodus Differentialis."

On Wednesday, May 21, a public meeting was held at the Mansion House "to promote the national work undertaken by the committee for testing smoke-preventing appliances." The Lord Mayor presided. Lord Derby proposed a resolution approving the objects of the committee. He thought that the diminution of smoke, and its necessary accompaniment dirt, was a matter which concerned everyone, except those who were fortunate enough to live away from great towns. Indifference was the real difficulty which they had to encounter, but in England anything which came to be recognized as a want was eventually supplied. The expenditure of fuel in creating dirt—for that was what it came to—was a waste of fuel itself, and the injury caused to property was not inconsiderable. He believed that more than three-fourths—he would say something like nine-tenths—of the smoke from collieries and factories was absolutely preventable, though some trouble and outlay would be required. Possibly more stringent legislation would be needed, but let them first try the experiment of enforcing the laws which they already had. Lord Howard of Glossop seconded and Prof. Chandler Roberts-Austen supported the resolution, which was carried unanimously. On the motion of Sir Henry Roscoe, M.P., seconded by Earl Fitzwilliam, and supported by Alderman Bowes (Salford), a resolution was passed in favour of the raising of a fund to meet the expenses of the work.

Some interesting explorations have just been made in connection with the famous Adelsberg Cave. The Vienna Correspondent of the *Daily News* says that various citizens of Adelsberg, wishing to ascertain whether the Ottoker Cave, discovered a year ago at some distance from Adelsberg, was in any way connected with the great cave, followed the course of the subterranean river Poik. It was known that forty years ago a party of explorers had their progress barred by a large lake, and the present adventurers therefore carried with them a boat.

Having successfully crossed the body of water mentioned, they came to lofty galleries through which the river flowed. It was possible to walk on the banks of the stream, but at intervals it expanded into small lakes, and the boat had to be used. At last the gallery branched into two corridors, one of which the stream rendered impassable, while the other was high and quite dry. The boat was dragged up, and the party proceeded. After crossing a fourth lake, the largest they had met, they found that the Ottoker Cave had been reached. The journey through the galleries lasted six hours. The explorers saw that they had by no means penetrated to the remotest parts of the grotto, and there is evidently still a wide field for discovery.

According to a telegram sent through Reuter's Agency from New York, a slight shock of earthquake was felt at Utica and at other points in the northern portion of New York State on May 25. The disturbance was felt more severely in Montgomery County. At Little Falls the shock was sufficiently strong to cause dishes and other similar articles to rattle, and subterranean rumblings were heard, while at Fort Hunter the buildings were so shaken that beds were moved and their occupants awakened. No damage was done.

Another telegram, sent through Reuter's Agency from Constantinople on May 26, tells of the destruction of an Armenian village by an earthquake. The village was Kayi, in the district of Refahie. Mineral springs spouted from the crevices made in the ground, and flooded the fields. There was no loss of life, as two days previously subterranean rumblings were heard, and cracks appeared in the ground, in consequence of which the Caimakan of the district ordered the inhabitants to leave the village.

On Sunday last an influential meeting was held in Madrid, at the official residence of the Prime Minister, to prepare the way for the celebration, in 1892, of the four hundredth anniversary of the discovery of America by Columbus. The meeting selected a Grand Committee, which will act in concert with the Spanish Government and the Royal Commission appointed some time ago, and presided over by the Duke of Veragua, a lineal descendant of Columbus, and the present Minister of Public Works. The Madrid Correspondent of the *Daily News* says that the most eminent among Spanish statesmen, as well as artists, writers, men of science, and military men, will assist on the organizing committees. It is proposed that the centenary shall be celebrated, if possible, by an Exhibition at Madrid. Vigorous preparations are also being made at Genoa for the suitable commemoration of the same great event.

The Danish Admiralty has ordered systematic hydrographical observations to be made all round the Danish coast. They began on May 1, and are to be continued regularly once a month on all lightships and on five movable stations. The object of these observations is to obtain detailed data concerning the ichthyological and meteorological conditions of the Danish seas. Special apparatus has been constructed by Captain Rung for the measurement of the percentage of salt in the sea-water.

We learn from *Science* that, at a recent meeting of the American Meteorological Society in Washington, resolutions were adopted "favouring the recognition of the eminent services of American electricians by perpetuating their names in the nomenclature of electrical units." At the Electrical Conference to be held in America in 1892, it will be proposed that the name of Joseph Henry—or some modification of it—shall be given to the unit of self-induction, "he having been the first to investigate that phenomenon, and his investigations having been more complete than those of other electricians before or since."

The temperature of snow at different depths has been investigated by Signor Chistoni. He finds that the variations in temperature of the lowest layer, next the ground, are extremely small, whilst the uppermost layer has often considerably higher temperature (as much as 10° C. at times). The temperature minimum of the air-layer next the snow was always lower than that of the uppermost snow-layer, while an air-layer about 20 inches above the snow had a higher temperature than the layer 1·2 inches above the snow.

Dr. J. Hann communicated to the Academy of Sciences at Vienna, on April 17, a memoir on the high air-pressure of November 12–24, 1889, in Central Europe, together with remarks upon high-pressure areas generally. As this anticyclone lay nearly the whole time over the Alpine district, observations could be made at various stations up to a height of above 10,000 feet. Dr. Hann found (1) that the high pressure extended to more than three kilometres above sea-level; (2) that at this altitude the relative warmth was as great as at a height of one kilometre, while the usual depression of temperature of winter anticyclones was limited to a few hundred feet above the earth; (3) that great dryness prevailed in the higher strata of the air. The author finds in these results a cogent reason for concluding that in barometrical maxima the air has a descending motion, and that the conditions of pressure are not explained by conditions of temperature, but are a consequence of the movement of the air. The temperature conditions are dependent upon the movements of the anticyclones, in the same way as the dryness of the air, and the clearness of the sky. In another section of the paper he investigates the vertical distribution of temperature in a barometrical minimum. During one instance, on October 9–10, 1889, he found that the temperature on the summit of the Sonnblick was lower than during the barometrical maximum above quoted. Until the establishment of mountain stations, the temperature was assumed to be one of the chief causes of the form of motion of cyclones and anticyclones, but future inquiries must take into account that up to at least four or five kilometres the temperature of the centre of an anticyclone may be, and probably always is, higher than in the centre of a cyclone.

In a recent number of the *Zeitschrift für Schul-Geographie*, Mr. H. Habenicht has written an article on the causes of the cyclones of the North Atlantic. The author points out that, if the globe were covered with water, the general circulation of the air would be very regular, without local depressions and steep barometric gradients, and he refers to the contrast of the systems prevailing, *e.g.* between the South Pacific and the North Atlantic. He finds the explanation primarily in the obstruction offered to the regular courses of the winds by the great continents to the east and west of the Atlantic; and, secondly, in the constant barometrical maxima over the continent in winter and in the neighbourhood of the Arctic regions.

The Massachusetts Institute of Technology, Boston, has issued the twenty-fifth annual catalogue of its officers and students, with a statement of its courses of instruction and a list of its alumni. The courses of study include the physical, chemical, and natural sciences and their applications; pure and applied mathematics; drawing; the English, French, German, and other modern languages; history; political science; and international and business law. It is claimed that these studies and exercises are so arranged as to afford a liberal and practical education in preparation for active pursuits, and a thorough training for most of the scientific professions.

In the entomological part of the forty-first Annual Report of the trustees of the New York State Museum of Natural History, lately published, reference is made to the statements which have been advanced as to the long imprisonment of beetles within furniture. The writer suggests that when such cases occur the conditions may bring about a lethargic state, in which respiration and accompanying phenomena are almost or entirely suspended through the complete exclusion of air (a hermetic sealing) by the rubbing, oiling, varnishing, or other polishing which the furniture has undergone. As an instance of prolonged vitality, he quotes an extract from the third Report on the insects of New York, by Dr. Fitch. In this passage Dr. Fitch says:—"In 1786, a son of General Israel Putnam, residing in Williamstown, Mass., had a table made from one of his apple-trees. Many years afterwards the gnawing of an insect was heard in one of the leaves of this table, which noise continued for a year or two, when a large, long-horned beetle made its exit therefrom. Subsequently, the same noise was heard again, and another insect, and afterwards a third, all of the same kind, issued from this table-leaf—the first one coming out twenty, and the last one twenty-eight, years after the tree was cut down." The evidence before Dr. Fitch convinced him that the insect was the longicorn beetle *Cerasphorus balteatus*, now known as *Chion cinctus* (Drury).

The *American Naturalist* quotes from the *Salem Register* an extract from which it seems that the museum of the Peabody Academy of Science of Salem, Mass., has lately been enriched by a fine collection of objects illustrating the art and ethnology of Japan. This has been formed by Prof. Edward S. Morse, who some time ago spent several months in Japan. The catalogue of Japanese accessions enumerates 691 specimens, the most conspicuous objects being life-sized figures, representing different classes of the community. These models were all made for the museum, and are the best that have ever been brought to America. The collection also includes many fine old swords, sets of tools, and pictures illustrating various trades and professions.

Some curious electrical phenomena were lately observed (according to a writer in the *Chemische Zeitung*) in a stearin and ceresin manufactory in Italy. One evening four vats of white ceresin (which is a paraffin got from ozokerit), containing about 500 kg. each, were being stirred to cool. When the point of solidification was nearly reached, the electric light of the place accidentally went out; and, to the surprise and alarm of the rather ignorant workmen, the mass of ceresin was observed to give pale sparks on the slightest motion. If the hand was brought near, loud sparks nearly two inches long were obtained. The phenomenon lasted over half an hour.

A valuable collection of Tibetan medical works and drugs has been brought by M. Ptitsyn from Transbaikalia. He has also collected most interesting information as to the courses of study at the Buddhist *lamas'* University at the Gusinoie Ozero Monastery in Transbaikalia. The curriculum lasts ten years, the first four of which are devoted to the study of the Tibetan and Mongol languages, to religious service, and to practice in drawing and various handicrafts. The next three years are given to medicine. During the first of these three years the pupils learn by heart the five volumes of the chief Tibetan hand-books of medicine, and the names of the drugs. The next two years are given to the study of therapeutics and surgery. The students also visit the Urga High School to follow the courses of the more renowned Tibet *lamas*, who come to Urga on purpose. The eighth year is given to astronomy and astrology, and the last two to philosophy and theology. Medicine is studied only by those who wish to devote themselves to the medical profession, and the courses of astronomy, astrology, philosophy, and theology are followed only by the best pupils. The chief (printed) medical work of Tibet is the "Rodijachava," or "The Tale of the *Curkhan* Otochi (god of Medicine) about what formerly was," a copy of which was secured by M. Ptitsyn. The Tibet medical authorities recognize 101 fundamental diseases, and M. Ptitsyn gives the names of 429 elements of drugs used by the Buddhist physicians. He notices that of the 101 diseases only two (paralysis and a kind of influence of the planets) are attributed to a mythical origin, and that of the 429 drugs only three have a similar origin (the bones of a dragon, the horns and the skin of the unicorn). The remainder are chiefly herbs, seeds, fruits, roots, and flowers, and partly mineral matters. They are all bought in Chinese drug-shops, except quinine, which is bought in Russia. M. Ptitsyn was allowed to visit one of the drug-shops, and found all drugs kept in order in separate drawers. He has brought to St. Petersburg samples of 202 different drugs, which will be analyzed at the Medical Academy.

Some sea-urchins are known to live in cavities in rock. And the diameter of the cavity is often wider than that of the entrance, so that the animal could not leave its home or be taken out without injury. On the French coast of Croisic (Lower Loire) may be seen thousands of urchins thus ensconced in the granite rock, which is rich in felspar and quartz. The animals, it is not doubted, make and widen the holes for themselves; but the question how has not been satisfactorily answered. Chemical solution of the rock seems excluded, considering both the nature of the latter, and also that no acid which could be thus used has been proved to exist in the urchin. The matter has been studied lately by M. John, and in an inaugural dissertation (*Arch. f. Naturges.*) he explains the effects by mechanical action. With the so-called "lantern of Aristotle" the animal probably bites the rock; the sucker feet are also attached, and a rotatory motion is imparted to the body, the prickle points, with the lantern, gradually wearing down the surface. These cavities afford a shelter to the urchins against the action of the waves. An attempt is made to conceal them by means of mussel and other shells. The rocks in which the cavities occur are in general thickly covered with calcareous Algæ. It has been thought that possibly these decompose the rock, and so facilitate the work of the urchins. M. John, however, finds no such chemical relation, but atmospheric agencies, he considers, may help the work of boring. A number of other animals are known to penetrate rock, and it is supposed that they do it also in a mechanical way. Recently, M. Forel described to the Vaudois Society of Natural Sciences how in the hard limestone of Constantine, Algiers, *Helix aspera* was found in holes 4 to 5 inches in depth.

It has been hitherto impossible, by the most careful and subtle methods, to produce absolutely pure water. Such water, it is thought, would have no conductivity for the galvanic current; but, as a matter of fact, there is always a measurable conductivity, which, in glass-vessels *e.g.*, gradually grows from day to day, through glass being dissolved. It has been lately observed by Herr Pfeiffer (*Wied. Ann.*) that water purified as much as possible, and standing only a short time in contact with the air, showed next day a continuous decrease of conductivity, which gradually disappeared, giving place to the normal unavoidable increase. After testing various explanations of this by experiment, he came to the conclusion that the true explanation is micro-organisms coming into the water, and absorbing the conducting substances present. On this assumption such organisms would appear to have an almost absolute power of absorption, something like that of sulphuric acid for water-vapour.

Mr. L. Upcott Gill has issued the first part of a volume entitled "British Cage Birds," by Mr. R. L. Wallace. The work will be completed in 15 parts, and will contain directions for breeding, rearing, and managing the various British birds that can be kept in confinement. Mr. Gill has published also the first part of "The Canary Book," by the same author. Both works are illustrated with coloured plates and wood-engravings.

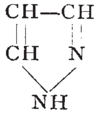
IN the new number of the *Internationales Archiv für Ethnographie*, Hermann Strebel continues his paper on a peculiar kind of stone object, found in Mexico and Central America, which is generally supposed to have been used in connection with the sacrifice of human victims. It is fashioned in the shape of a yoke or bow, and enriched with sculpture. Herr Strebel shows that it was worn as a mark of honour by persons of high rank. The sculpture was, he believes, of a symbolical character. Dr. L. Lewin, of Berlin, contributes an interesting paper on betel-chewing, adding fresh information to that which he brought together in a previous article. M. de Clercq gives some notes (in Dutch) relating to New Guinea, and Herr H. Vos deals with the area of anthropophagy on the Asiatic continent.

THE Leicester Literary and Philosophical Society has issued the third part of the second volume of its Transactions (new quarterly series). Among the contents are the abstract of an address, by Prof. Flower, on pygmies; a paper on spiders, by the Rev. W. Agar; and a contribution to the pterylography of birds' wings, by W. P. Pycraft.

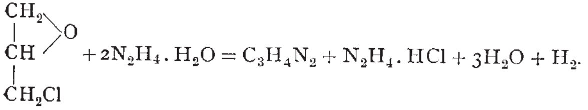
WE have received Part 20 of Cassell's "New Popular Educator." It is carefully illustrated, and contains maps of Eastern Australia and New Zealand.

MR. JOHN WHELDON has issued a catalogue of zoological works, and papers, transactions, and journals relating chiefly to anatomy and physiology. A catalogue of works on astronomy, magnetism, and meteorology has been issued by Messrs. Dulau and Co.

PYRAZOL, $C_3H_4N_2$, the fundamental base of a rapidly growing series of compounds, has been synthesized by Prof. Balbiano, of Messina, from epichlorhydrin and the recently isolated hydrazine hydrate (*Berichte*, No. 8, p. 1103). Pyrazol is a pentagonal closed chain compound, which may be represented

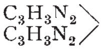


The reaction between epichlorhydrin and hydrazine hydrate is a somewhat violent one, a considerable amount of heat being generated. It appears to take place in the manner indicated by the following equation:—



$$CH_2 \cdot CH \cdot CH_2Cl\ (CH_2, CH > O) + 2N_2H_4 \,.\, H_2O = C_3H_4N_2 + N_2H_4 \,.\, HCl + 3H_2O + H_2.$$

Equal weights of epichlorhydrin and hydrazine hydrate, which latter is a liquid boiling at 119° C., are cautiously mixed in a flask, to which is immediately fitted a reflux condenser. The reaction completes itself in 3–4 minutes without any external application of heat. When the reaction is at an end, and the last trace of the epichlorhydrin has disappeared, the flask and contents are heated in a water-bath for 25–30 minutes. After allowing to cool, a quantity of zinc chloride equal to that of either of the reagents is added, in order to facilitate the splitting off of water. The whole is afterwards again heated for an hour over the water-bath. The yellow waxy mass so obtained is then mixed with 300–400 c.c. of water for every 10 grams of either reagent employed, and the mixture distilled in steam. Pyrazol and ammonia distil over in the steam together, and, in order to separate the pyrazol, the distillate is treated with a solution of mercuric chloride, which produces a mixed precipitate of the mercury compound of pyrazol and mercurammonium chloride. The precipitate is suspended in water, decomposed with sulphuric acid, and the solution of pyrazol hydrochloride and salammoniac evaporated to the crystallizing point on the water-bath. The residue is then decomposed by potash, and the pyrazol extracted by ether. Upon evaporation, pyrazol is obtained as a mass of hard colourless needles. The crystals of pyrazol are readily soluble in cold water, with production of a neutral solution. They possess an odour very similar to that of pyridine. They melt to a colourless liquid at 69·5°–70°, and the liquid boils at 186°–188°. The aqueous solution gives a white precipitate with mercuric chloride solution and with an ammoniacal solution of silver nitrate. In all these respects the pyrazol thus prepared from epichlorhydrin and hydrazine hydrate is identical with a substance of the formula $C_3H_4N_2$ prepared some little time ago by Buchner by heatingthe methyl ether of acetylene-dicarboxylic-diazoacetic acid. A concentrated hydrochloric acid solution of pyrazol gives, with platinum chloride, a precipitate of lustrous yellowish-red needles of pyrazol-platinate $(C_3H_4N_2 \,.\, HCl)_2PtCl_4 \,.\, 2H_2O$. When this salt is heated to 205°, the colour changes to straw-yellow, and remains permanent up to 250°. The yellow substance is a definite compound, insoluble in water, and possessing the composition



$\begin{matrix} C_3H_3N_2 \\ C_3H_3N_2 \end{matrix} > PtCl_2$. It is formed from pyrazol-platinate by loss of two molecules of water and four molecules of hydrochloric acid.

THE additions to the Zoological Society's Gardens during the past week include two Beatrix Antelopes (*Oryx beatrix* ♂ ♀) from Arabia, presented by Colonel Ross; a North African Jackal (*Canis anthus*) from North Africa, presented by Captain Hay; a Common Paradoxure (*Paradoxurus typus*) from India, presented by Mr. C. Armstrong King; a Vociferous Sea Eagle (*Haliaëtus vocifer*), a White-crested Tiger-Bittern (*Tigrisoma leucolophum*) from West Africa, presented by Mr. J. B. Elliot; a Mexican Guan (*Penelope purpurascens*) from Mexico, presented by Mr. J. W. Dawe; two Common Kingfishers (*Alcedo ispida*), British, presented by Mr. T. E. Gunn; a Tawny Owl (*Syrnium aluco*), British, presented by the Hon. C. Parker; two All-green Snakes (*Philodryas viridissimus*), two Natterer's Snakes (*Thamnodynastes nattereri*), two Merrem's Snakes (*Liophis merremi*), a Chequered Elaps (*Elaps lemniscatus*) from South America, presented by Mr. A. C. Derrett; a Barraband's Parrakeet (*Polytelis barrabandi*) from New South Wales, a Brush Turkey (*Talegalla lathami*) from Australia, deposited; an Eland (*Oreas canna* ♂), bred in France, two Diademed Jays (*Cyanocitta diademata*) from Mexico, two Temminck's Tragopans (*Ceriornis temmincki* ♂ ♀) from China, purchased; two Persian Gazelles (*Gazella subgutterosa* ♂ ♂), born in the Gardens.

OUR ASTRONOMICAL COLUMN.

OBJECTS FOR THE SPECTROSCOPE.

Sidereal Time at Greenwich at 10 p.m. on May 29 = 14h. 29m. 9s.

Remarks.

Name.	Mag.	Colour.	R.A. 1890.	Decl. 1890.
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(1) G.C. 3846	—	—	14 14 45	+ 4 26
(2) D.M. + 15° 2758 ...	5	Reddish-yellow.	14 40 45	+15 35
(3) o Boötis	4	Whitish-yellow.	14 40 6	+17 26
(4) ζ Boötis	3	White.	14 35 54	+14 12
(5) χ Cygni	Var.	Very red.	19 46 20	+32 38

(1) There are no very bright nebulæ which come to the meridian near 10 o'clock during this week, but the one given is probably one of the brightest. The General Catalogue description is: "Bright, pretty large; round; pretty suddenly brighter in the middle; barely resolvable (mottled as if with stars); a 12th magnitude star in *nf* quadrant." The spectrum has not been recorded.

(2) According to Vogel and Dunér this star has a magnificent